

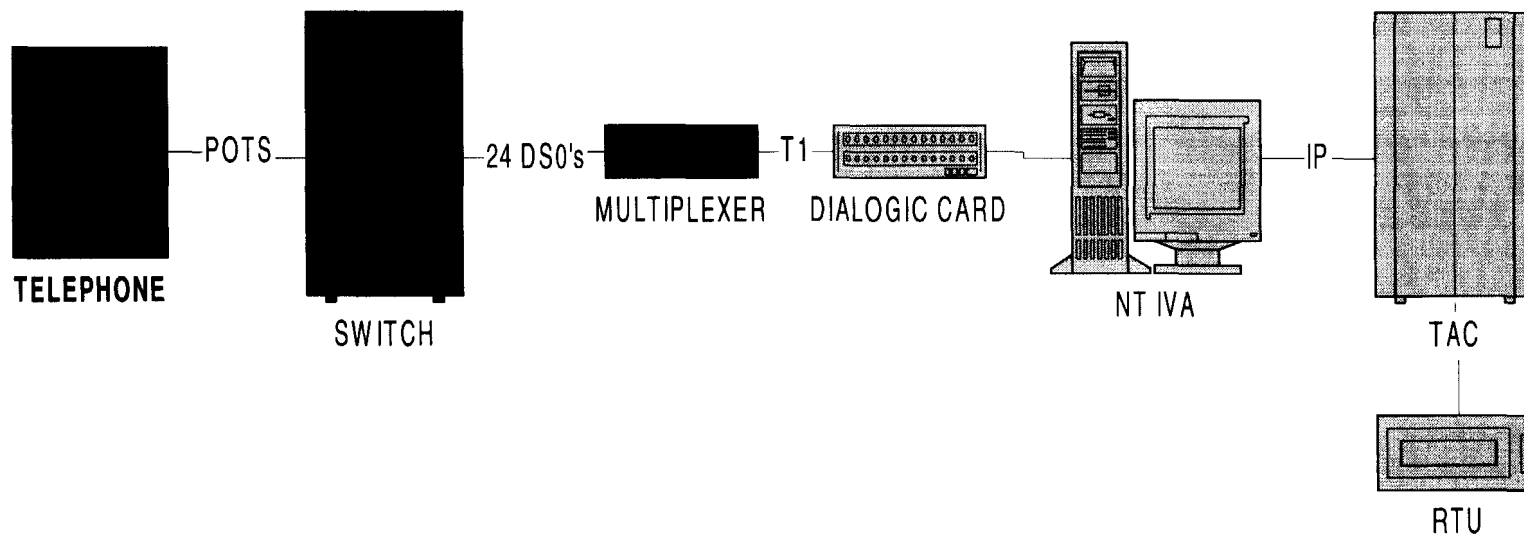
- IVA Service
 - Operates as a Windows NT Service
- IVA Administrator
 - GUI to the IVA Service
 - Provides tools to configure, monitor, initiate, and terminate IVR Service
- IVA Script Editor
 - Drag and Drop GUI to build custom IVA scripts
 - Can reside on server or networked PC
 - Allows customers to build their own Flows

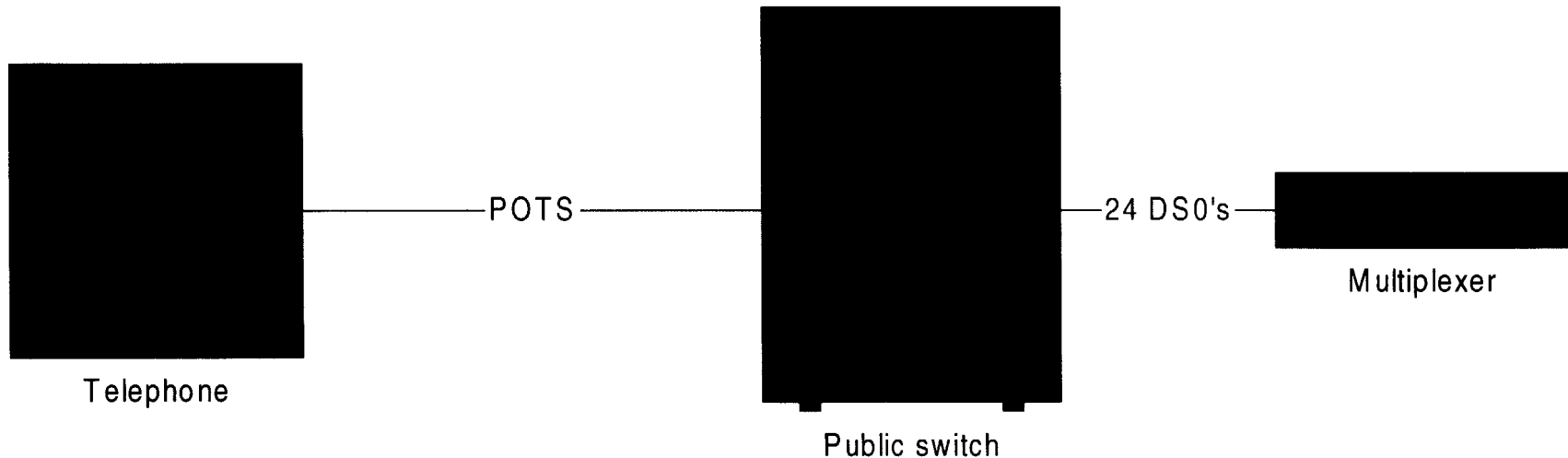
Hardware Requirements



- Server resides on NT workstation
- Supports up to 48 ports per Server
- Uses standard PC dialogic card
 - Available in 12, 24, 48 port configurations

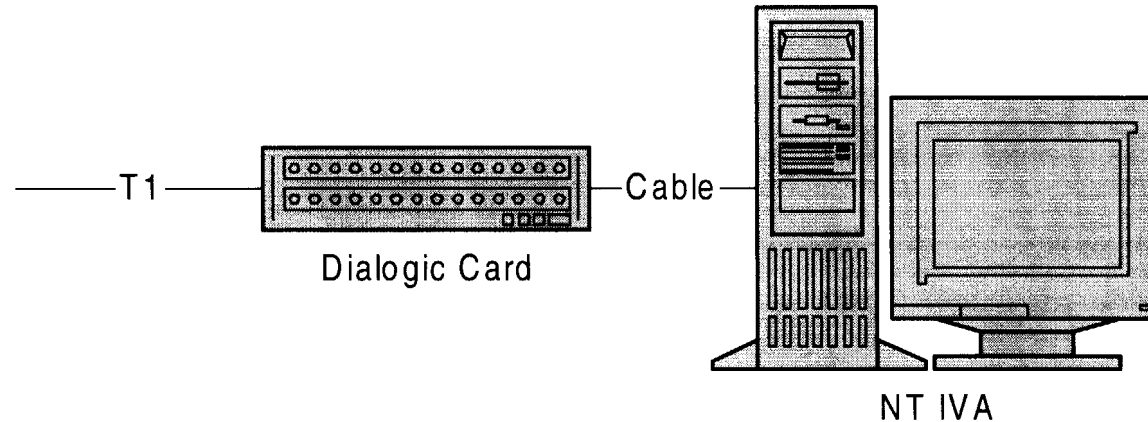
Hardware Connectivity



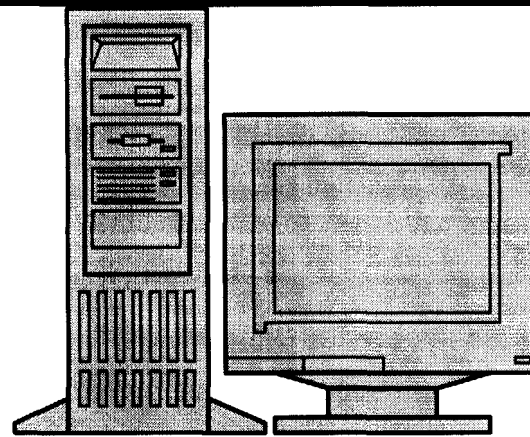


- The Access Number is Called from Any Phone
- The Call is Processed to a Hunt Group.
- The Hunt Group is Muxed into a T1

IVA Process

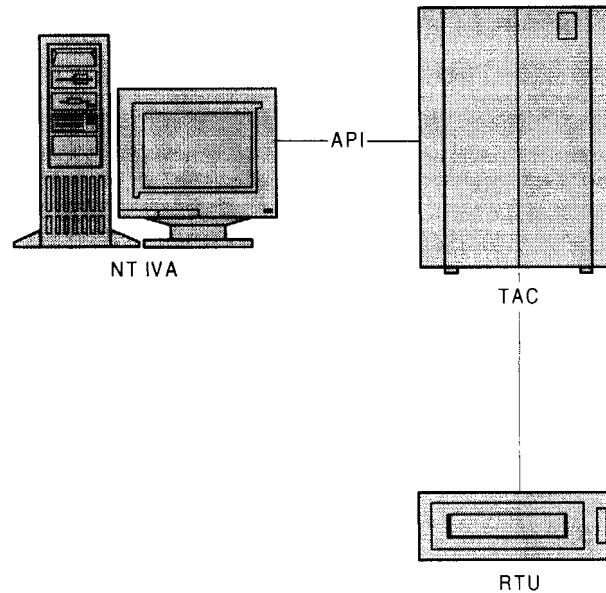


- The T1 is Routed to the Dialogic Card
- The T1 is DeMuxed into 24 DS0's
- The Call is Answered by the IVA System



IVRS

- The IVA script is executed
- Responses are sent via DTMF to IVA software
- DTMF is converted to a text request that TAC understands



- Request is forwarded to TAC via IVA API
- Response is sent back to IVA through API
- Data is parsed by IVA application into variables
- Content of the variables are “spoken” based on user selection



- 4/27/00

- Provides an integrated vendor independent answer to access.
- Easy to install and configure
- Easy to use Drag & Drop GUI for creating call flows and functions
- Access to key functions including
 - Interfacing to SQL compliant databases
 - Call processing functions including call transfer via flash hook
 - Assigning different scripts to phone lines
- In-house expertise removes 3rd party vendor integration
- Flexible! Flexible! Flexible!

Conclusions and Recommendations

RECEIVED

MAY 17 2000

FCC MAIL ROOM

HARRIS

Challenges of Testing in the Unbundled Loop Environment

Cooperation for Deployment of DSL
Services

Analysts estimate 1.5 million businesses will switch from dial-up or ISDN access to DSL by 2002.

... backlog of 15,000 to 20,000 customers waiting for service.

... now that I have it, I'm never giving it up!"

"And once you get used to DSL, going back to a 56k modem would be like trading my car in for a horse and carriage!"

... But there are problems

HARRIS

DSL deployments hitting snags

By John Rendleman, *PC Week* (<http://www.zdnet.com>)

"My DSL took **9 weeks** to get installed."

"It's been nearly **13 weeks** since I have applied for DSL service in Vancouver."

"Over **2 months** now, and they're incredibly unsure if my house can get it or not. Total pain."

"... they took **9 weeks** and never hooked me up. They put the blame on everyone else."

"We didn't have trouble getting it provisioned, but we have had problems with the **reliability of our DSL**"

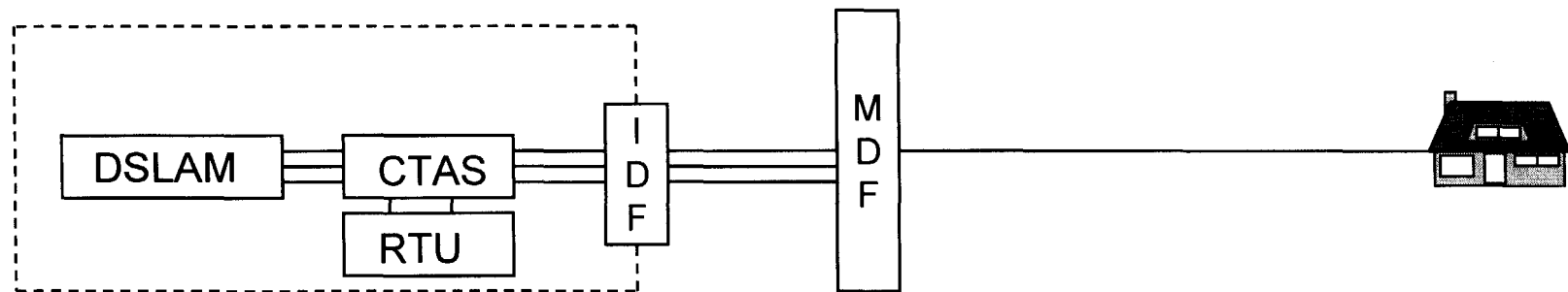
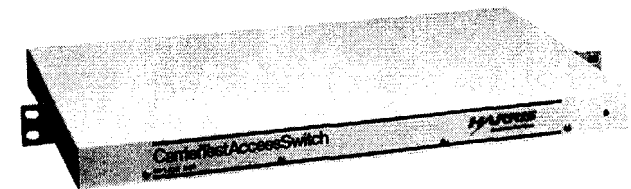
"... continually **adds to its work** (now at 1,300 employees) to keep up with demand, "but that's more of an industry wide challenge than one that's individual to us,"

- New technology requires new tools and processes
- Need to help reduce the troublesome and long installation process
- Three major issues to cover
 - Remote loop access
 - Expanded physical layer testing
 - ILEC / CLEC process improvement tools

Remote Access to the Loop

HARRIS

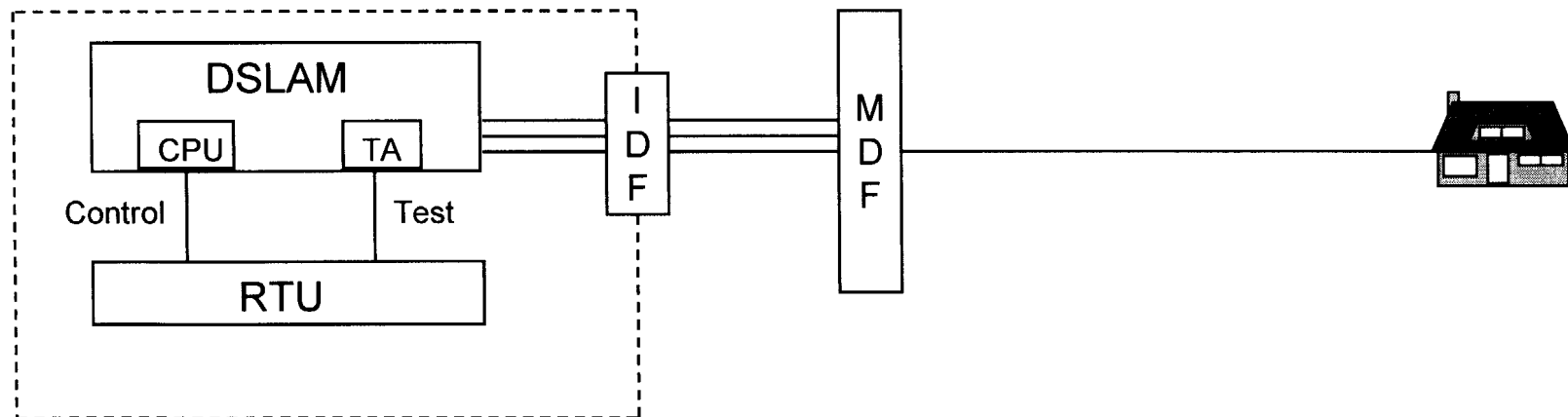
- Many DSLAMs don't have test access built-in
- For those DSLAMs that don't...
- Need separate Loop Access product
- Harris' Carrier Test Access Switch (CTAS)
 - Installed between DSLAM and MDF
 - Supports up to 128 pair
 - Daisy chained to scale easily



Remote Access to the Loop

HARRIS

- But many DSLAMs do have test access built-in
- For those it's best to have a direct interface to the test equipment
- Similar to most switches and DLCs

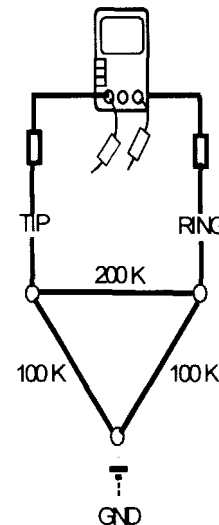


Expanded Loop Testing

HARRIS

- DSL still relies on the local loop, so much of the physical layer testing is applicable and necessary
 - Accurate three terminal testing
 - AC/DC opens, shorts, grounds
 - Capacitive measurement
 - Length
 - Balance
 - Noise tests:
 - Longitudinal balance
 - Metallic
 - C-message
 - Load coil detection and spacing
 - Interactive tests with the field technician

**Measurement Accuracy
2-Terminal Vs. 3-Terminal Test**



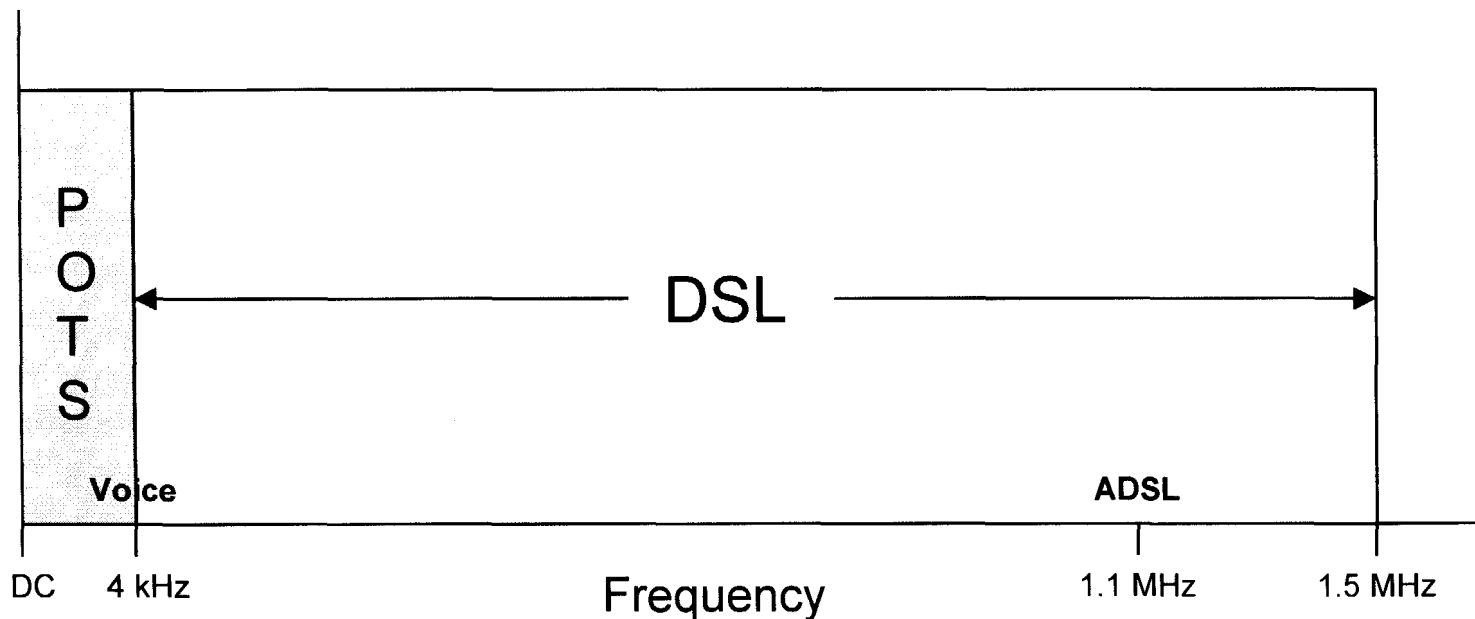
CRAFT: DC SIGNATURE

<u>KOHMS</u>	<u>VOLTS</u>	
100.0		T-R
75.0	0.00	T-G
75.0	0.00	R-G

RTU: DC SIGNATURE

<u>KOHMS</u>	<u>VOLTS</u>	
200.0		T-R
100.0	0.00	T-G
100.0	0.00	R-G

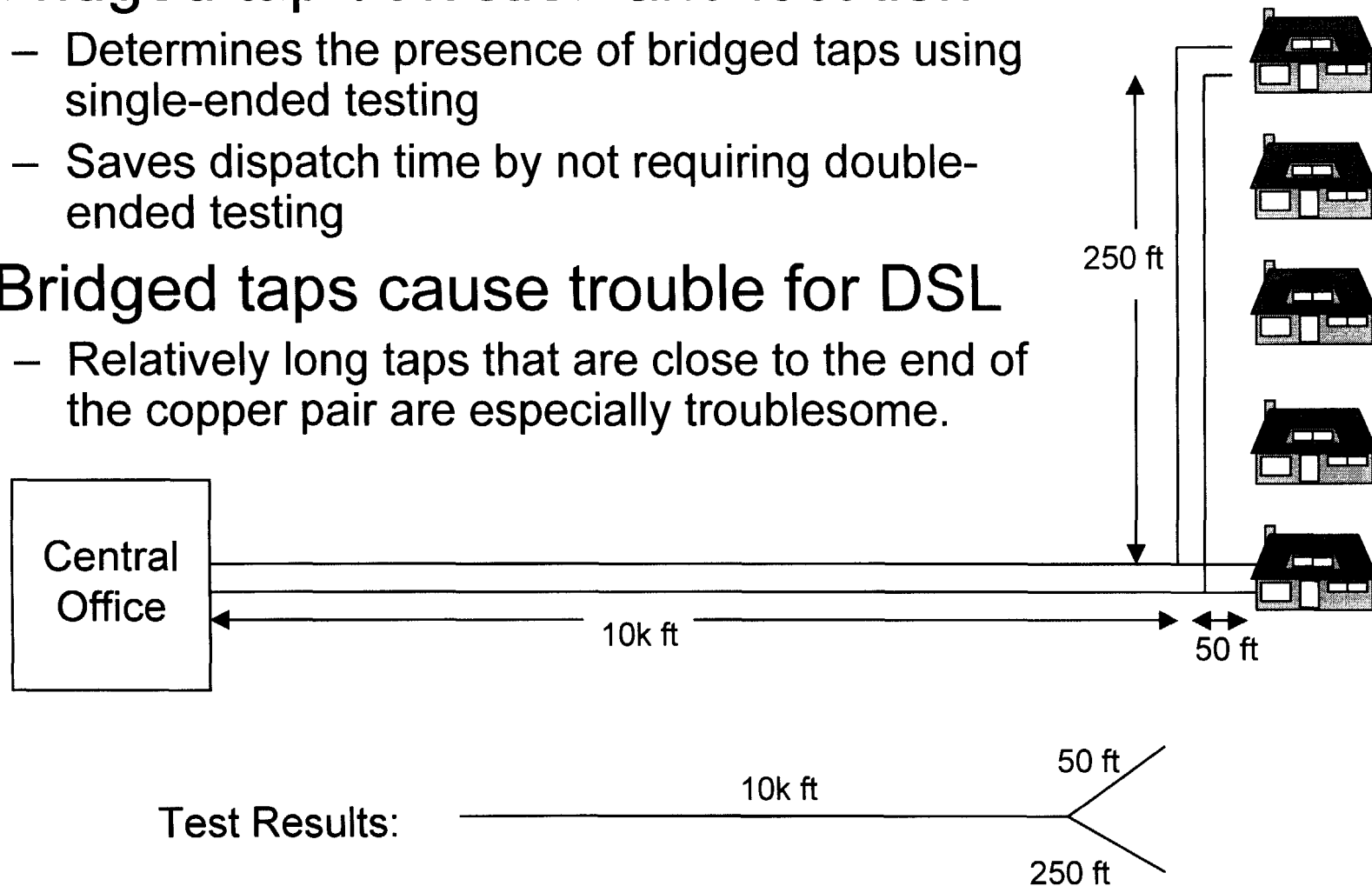
- DSL needs more...
- High frequency noise testing
 - Used to more accurately pre-qualify lines, finding high frequency noise that the RTU alone can't measure
 - Also used to help troubleshoot and recognize crosstalk noise



Bridged Tap Detection

HARRIS

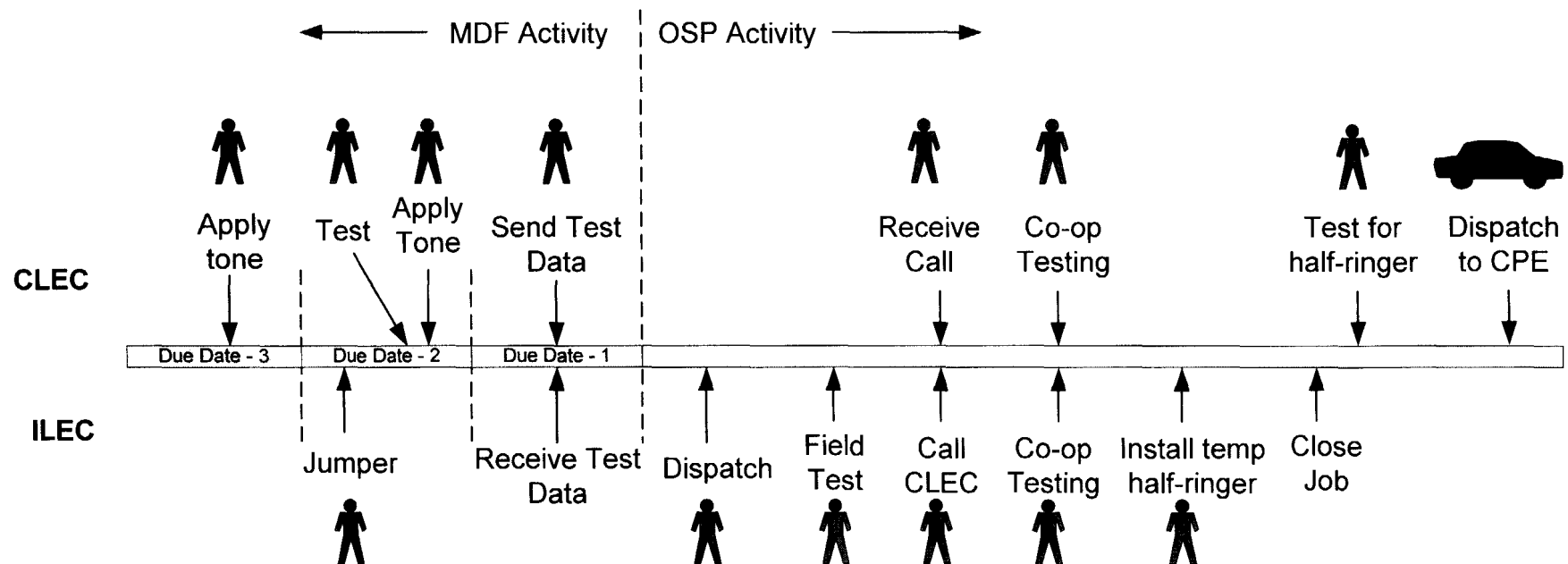
- Bridged tap detection and location
 - Determines the presence of bridged taps using single-ended testing
 - Saves dispatch time by not requiring double-ended testing
- Bridged taps cause trouble for DSL
 - Relatively long taps that are close to the end of the copper pair are especially troublesome.



ILEC / CLEC Process

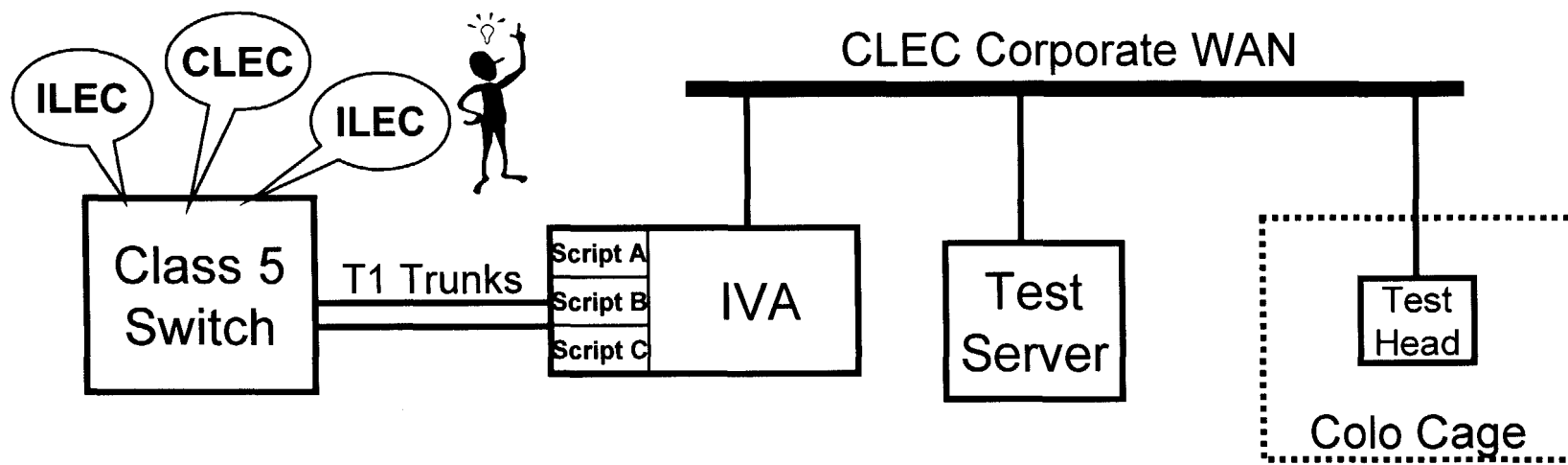
HARRIS

- CLEC / ILEC interactions still not too automated
- Inefficient operations - too many dispatches required
- A sample of the “old” process...



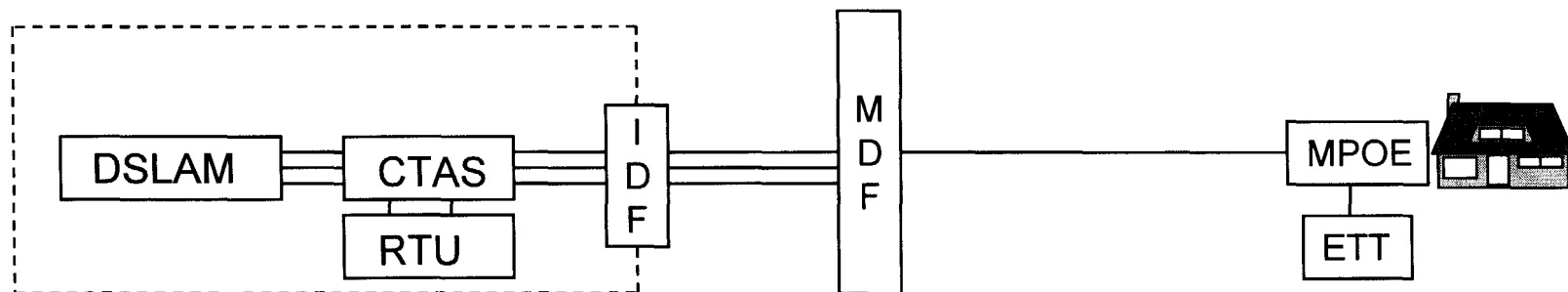
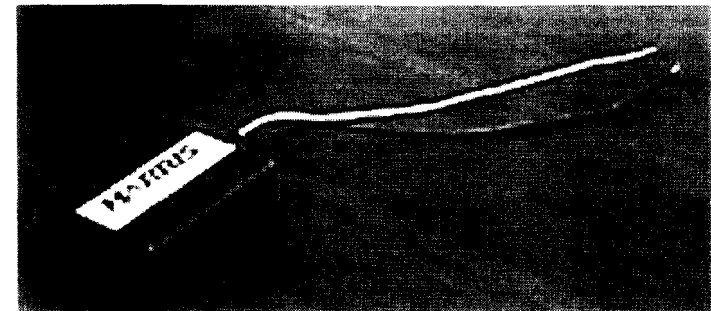
- Interactive Voice Access

- Allows remote voice (touch-tone) access to the test system
- Deployed by the CLEC - but can be used by either the ILEC or CLEC technicians
- Vastly improves CLEC efficiency by minimizing the number of people needed at the operations center
- ILECs more efficient since they have access to the loop
 - Tone on the line to help find the pair
 - Testing for troubleshooting during install



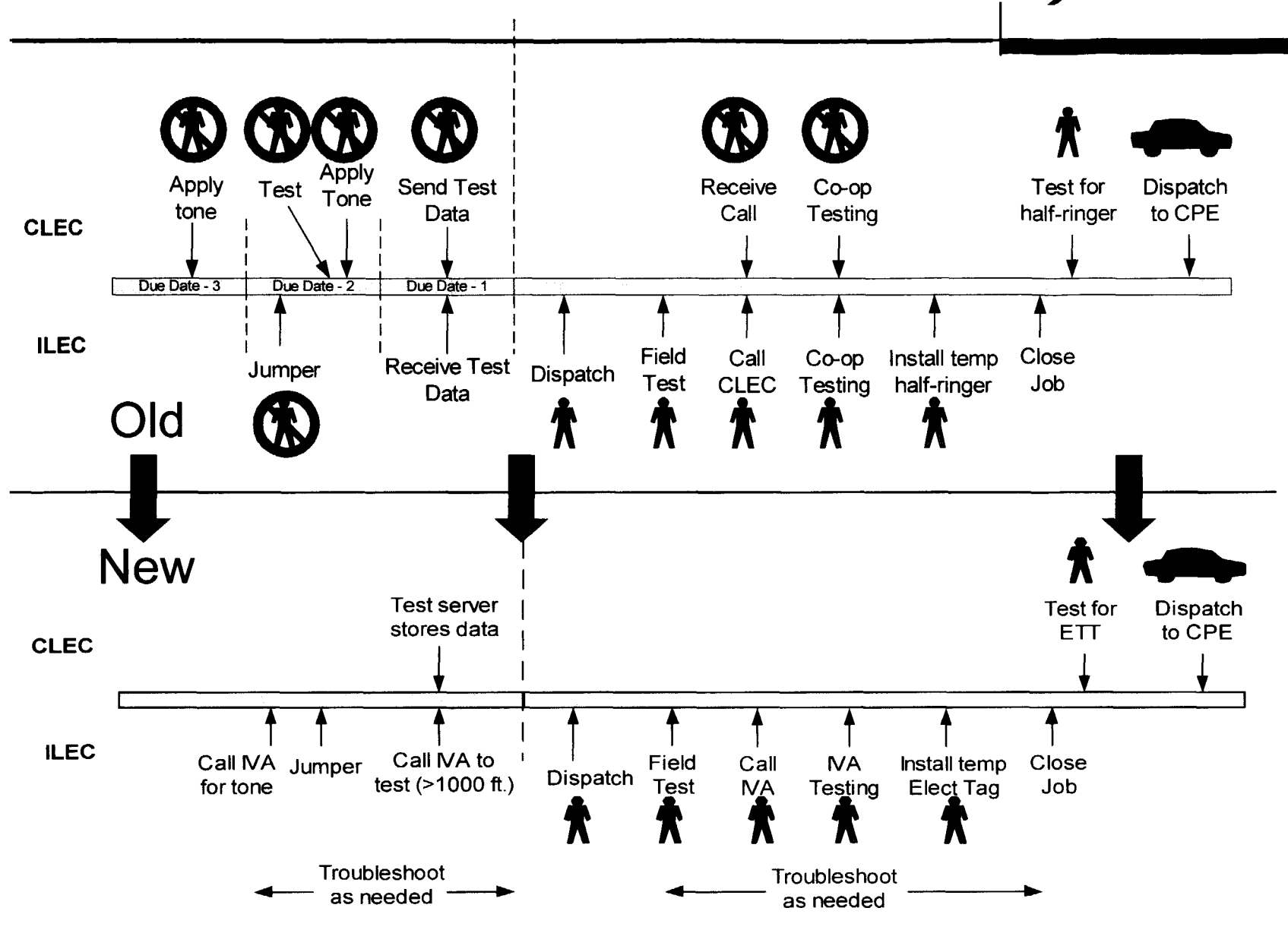
- Electronic Test Tag

- Proves Circuit Continuity to Minimum Point Of Entry (MPOE)
- Better than a Half-Ringer
 - No False Ringer Termination
 - Full Multimeter Testing of Loop in Inactive State
 - Positive Signature When Activated
- Reusable on Subsequent Installations
- Compatible with Current Harris RTU Hardware and Software



Old vs. New Process

HARRIS



- Harris offers a variety of products offered to CLECs and ILECs:
 - Comprehensive Line Testing
 - Remote Loop Access
 - IVA for field access to the system
 - ETT for positive line signature
- Helping to address the obstacles to fast and efficient DSL deployment, troubleshooting and maintenance



Thank you!

Questions?